

The Files

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Trip Report - 1959 National Symposia on Engineering Writing and Speech

1. On 17 and 18 September 1959, a trip was made to Boston, Massachusetts for the purpose of attending the 1959 National Symposia on Engineering Writing and Speech. The symposia was sponsored by the IRE Professional Group on Engineering Writing and Speech (PGEMS). The conference sessions were conducted both days in the Sheraton Plaza Hotel between the hours of 9:30 a.m. and 5:30 p.m. The Boston session had a daily attendance of approximately 200 people, and with the exception of two or three papers, the general convention program was extremely interesting.

2. The IRE/PGEMS group was formed about three years ago to do something about a most serious deficiency in the engineering profession--a lack of communicating ability. Man's progress through the centuries has depended largely on the ability to communicate with his fellow man. To keep ahead in advanced technology, all possible duplication of engineering effort must be avoided. What one engineer has discovered must be made clearly known to his fellow engineers. We must communicate! This in essence was the theme of the keynote address, "Background to Scientific Communication," delivered by Dr. M. M. Kessler of the M.I.T. Lincoln Laboratories.

3. Dr. Kessler continued with the statement that many engineers are not good writers, and of course the converse, that many writers are not good engineers. Effective communication in engineering is currently assumed by many people in the industry but not much has been done to date to correct this false assumption. Attempts are being made today to have more effective communication, but what is effectiveness in communications? Dr. Kessler felt that some measure of effectiveness is direly needed. Just as other professions have tools of one sort or another, technical writing is a tool for the engineer to communicate his ideas. The current need for effective communication and writing has resulted from the increase in science (for example, the Sputniks) by new fields of scientific information, and by enlarged groups of society requiring this knowledge. The keynote speaker felt that because of the huge scope of a program to enlarge effective communication in the engineering profession, a government sponsored program would be necessary. Unfortunately, however, the public is not ready to accept this. But, for the public's own benefit, current technical information is needed now, not yesterday or tomorrow.

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4. Effective communication can be solved by many approaches, or as the speaker called them, roads. Dr. Kessler suggested the following: (1) Have a regional center, the main purpose of which for the time being would be experimental; (2) locate this center in an area of science, i.e. where you have a generator (universities) and a consumer (industry corporations and vendors). The city of Boston was used as an example. Experiment in three fields: (a) technical, such as the use of computers, etc. for programming the information; (b) determine the nature of the engineering literature of given science, for example, Physics; (c) develop criteria for deciding literature of an individual field. In this particular system indexing, of course, would become a great problem. A scheme would have to be devised to evaluate various portions of scientific papers.

5. In a system of this type, the system must be semi-rigid since communication is needed between the user and giver of information, either animate or inanimate. For example, in systems evaluation the user should be able to (1) ask a specific question and get a specific answer, or (2) ask a specific question and get the location of an answer, or (3) ask a specific question and get a probable answer, or (4) ask a probable question and get a probable answer. Of course, the system should be independent of language and have a method for purging or revising information. An interesting fact to note is that the half-life of a technical paper in a particular field is approximately 3 to 4 years. A paper appearing in the Physical Review is seldom quoted after that length of time.

6. Some operational methods for the system described by Dr. Kessler could have any one or a combination of the following methods for permitting the user to receive the information in the system. For example, a telephone could be connected into the system whereby the user would call the system and ask for specific information. By call is meant the dialing of a specific code on a telephone dial; second, an audio system could be devised to and from a technical library; third, a mail system to transmit technical literature or documents; fourth, radio/television could be utilized by use of closed circuit arrangements; and fifth, the use of newspapers whereby a section of the newspaper would be reserved for the publication of various technical papers and information such as the financial sections of newspapers today. As may be realized, a system of this type will not be an overnight job. It will have to grow slowly.

7. The following paragraphs describe most of the papers presented at the Symposium. All papers are summarized under their respective titles.

A. Technical Communication for Modern Society by Mr. Dudley, Assistant to the Director of Lincoln Laboratories.

This paper was a collection of personal views by the author and was emphasized as such. Historically, research as we know

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it today got its start around the year 1900 by the Bell Telephone System which was followed closely by General Electric. After 1925, everyone began to get into research and development. World War II accelerated the program until the present when "everyone and his brother" are in the field. Today, it is not possible for the individual inventor to make any outstanding advances. All the simple things are done. In the present era one has great complexes (laboratories) doing the creative work. Today many fields all contribute to a common goal. This is the age of specialists. Unfortunately though, specialization has created isolation and seclusion. In the field of communicating and writing there are probably three major areas. These are: (1) the scientist who wants to know; (2) educators, medical profession, etc., who will guide the public; (3) the ordinary citizen. In conclusion, the speaker offered the following suggestions and comments. Scientific papers are slowly losing their appeal. They are being replaced by technical abstracts and reprints. New techniques must be introduced for effective communications in the sciences similar to that described in the keynote address. Are we using or developing indexing techniques and cataloging techniques to their best advantage? In conclusion the speaker suggested that concise and penetrating abstracts of technical papers be prepared for the consumption of statesmen, etc. and those who have a need for but no comprehension of technical information.

B. Scientific and Engineering Report Writing by Mr. Gardner Pope of the Johnson and Moreland Company.

Science and engineering advance in direct proportion to the clarity and effectiveness of reports. Writing a technical report is more than the composition of words on paper. It covers all phases from the early planning and layout on through to the printed and bound report. One of the broader aspects a technical editor must consider is a familiarization with all the techniques of the finished product. Since writing creates a fluid situation the writer must first analyze the overall job, determine what has been done, determine what the current status is, and determine what will be done. Secondly, the writer or editor must use the proper techniques. This consists of sizing up the overall job, determining what is required, when it is due, and the object of the report.

The technical editor should organize a team to help in the preparation of the report. The editor may then relieve himself of many minor details and concentrate on the overall problems involved. A concentrated effort should be given to the job. The report should be constantly reviewed at various check points, otherwise the report

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is apt to go off on various tangents. In the preparation of a report of the longterm type, the method used to gather or extract information is important. The technical editor should anticipate information in advance by requesting from the project engineer weekly reports of what was done and a prediction of what is scheduled for the following week. This may be done in the form of an informal report to the technical editor. In lieu of the foregoing, the technical editor may request a complete rough draft. In all cases the request should contain a precise statement of what information is required. An additional method which was suggested for obtaining information was the interview. The technical editor might conceivably interview the project engineer in the presence of a recording device or a shorthand secretary.

In a technical report the layout of the report is often quite important, since information must be presented to various management levels. Detailed information (statistical or graphical) should be tucked away in the rear of a report such as an appendix. The main part of the report should contain the overall picture of what one is trying to convey. At the end of the paper the speaker arrived at several important conclusions. There are no cut and dry techniques for all situations. The supervisor of a report must exercise strict control over the report. Bold thinking to all problems is a must.

C. Engineers as Communicators by Dr. I. Getting - Raytheon Company.

The engineer is a source of engineering information. How he communicates with those who have a need-to-know is crucial to science and the industry itself. The choice of language in communicating is very important. Care must be taken to choose words which express what the writer is trying to say. Numbers, statistical data, etc. should be relegated to their proper position. The writer should not underestimate the power that may be obtained from the graphic form of presentation.

D. Some Legal Considerations in Presenting Technical Information by Robert Rynes - Boston Attorney.

Proprietary rights, legal and applied obligations, and other considerations involving disseminating of engineering information were discussed by the speaker. A lengthy discussion concerning the copyright—what it is and how it operates—was also covered. The copyright law was discussed in respect to dealing with the Federal Government. In particular, the NASA position to the copyright law was quite interesting. When doing business with this agency of

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the Government the individual or corporation automatically relinquishes all rights to any copyright of an invention, paper, or what have you. Mr. Rynes expressed comments on the validity of the law, but since no court cases have been tried as yet, no definite conclusions may be formed at this time.

E. Space Technology: Reporting the New Dimensions by Robert Hehmann of IPM.

Mr. Hehmann felt that the most common engineering communications document was the engineering notebook. Disseminating the contents of the notebook to interested parties even in rough draft form might be very rewarding.

In respect to NASA's research work, this is the first time in many years that the university level has the biggest share of basic R&D contracts. Of course, the universities have a resulting obligation to report back in quality communications and writings to the Government. The man best qualified to do this reporting, the speaker felt, was the project engineer who actually does the work. Unusual as it may seem, the speaker felt that this is not as difficult as it would normally seem.

The Classical reporting approach of the university era, 1600-1800, which played an important part in early research and development, was suggested by the speaker. This method encompasses the consolidation of raw data and its subsequent review. The data should be tabulated and consolidated into a quantitative list. Then a written discussion of the problem would be prepared which would consider the facts only. Finally, a section on conclusions and queries would be made.

F. Panel Discussion - How to Communicate Effectively (Panel composed of military and civilian members).

The panel discussed the engineering proposal from both the contractor's and the Government's viewpoint. Since an engineering proposal can either make or break the awarding of a Government contract the question, "What is the Government looking for in an engineering proposal?" naturally arises. When the cognizant Government agency reviews an engineering proposal many factors are considered in addition to the hardware item. The Government is buying along with the hardware the competence or excellence of a company. How well do they understand the problem under immediate consideration? What is the enthusiasm and interest of top management of the company in respect to the proposal? The latter may be gauged

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by the level of personnel it has sent to discuss and deliver the proposal to the cognizant Government group. Is management willing to use a portion of its own funds in the area of basic research and development? Since many of the foregoing areas are of a somewhat abstract nature, the technical editor must be careful to present and write his ideas in such a way that they may be easily understood.

In respect to hardware items, the Government is looking for quality of product, simplicity of operation, servicing, maintenance, compliance with specifications, and delivery schedule. The contractor should attempt to present a concrete program presentation in his proposal. The engineering approach along with a discussion of the principal technical phenomenon involved are among the principal considerations. The contractor should indicate why he feels his technical approach is a sound one. Many times it is to the contractor's advantage to indicate and discuss the various approaches which have been considered and rejected along with the operational and technical advantages of the system which was finally selected. If a contractor has performed work successfully for a customer in the past, some reference to a previous proposal is definitely in order. A graphical presentation showing the steps which will be required in the research and development are also very helpful. The contractor should strive for a logical presentation at all times.

In order to justify a high cost of a hardware item, the contractor may find it to his advantage to predict time versus technical accomplishments to justify the cost. Discussion of additional items such as type and frequency of progress reports, company qualifications (physical and personnel wise), and special project groups which will be formed for the project in question are all requirements for a successful proposal. Finally, contractual and cost details may be either covered in the proposal proper or by special cover letter to the proposal. In an engineering proposal, the panel felt that professional integrity and honesty were the most important items to be considered.

Since only one proposal is usually accepted for a given piece of hardware, the panel next considered the negative side of the question, that is, "Why are proposals rejected?" Many times, over simplification of a problem on the contractor's part will cause his

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proposal to be rejected. Misinterpretation of original specifications, inadequate cost and price information, or blue-sky dreaming on the part of the contractor will not qualify him for consideration. If a proposal is impossible to understand, that is, if it combines fact and fiction indiscriminately, or if the contractor offers no significant advance in the state of the particular art, his proposal may be rejected.

In the preparation of a proposal it was the panel's considered opinion that by using a direct approach and using simple, precise language the contractor will gain a decidedly positive advantage. It is not necessary to constantly repeat specifications and to paragraph information which will just add bulk to the report. Above all, all sales talk should be eliminated from an engineering proposal. Furthermore, the panel indicated that it is not necessary to prepare a fancy proposal using color reproduction methods and leather-bound covers. The cost of the proposal should be kept to a minimum. The company should spend no more money on the preparation of a proposal than it feels it can lose in the possible rejection of the proposal by the customer.

G. What Technical People Can Learn From the Advertising Technique
by Mr. Corso Donati - Randall Advertising Agency, Boston, Massachusetts.

Mr. Donati presented a general discussion of the Bomac advertising campaign which is being conducted by the Randall Advertising Agency. He was introduced by the moderator as "the gentleman who has done the most to further the knowledge of the use of radar during the Punic Wars." Prior to the start of the Bomac advertising campaign, the company was relatively unknown and they needed a unique method of presenting their product to the engineering trade. As a result the Bomac campaign was centered around the use of radar (utilizing Bomac tubes) presented in an amusing but intelligent fashion. The three main features of the Bomac ad are, (1) it is unique, (2) it is amusing, and (3) it combines humor with the selling message. The total cost of the campaign was approximately \$80,000 which Mr. Donati indicated was not an excessive figure. The Bomac ads did create considerable interest as may be noted by the fact of a 20% increase in sales after the first several ads had appeared in various technical publications.

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In order to translate advertising techniques into technical writing, Mr. Donati indicated the following points. First of all, know well what you are going to say; secondly, create a particular tone or style of writing which will more or less identify; third, don't be too serious of something that is a plain fact; four, know your subject thoroughly to write effectively; and five, use a conversational style of writing so the reader will be more apt to read thoroughly the complete message.

H. Language as an Engineering Tool by J. R. Gould of the Rensselaer Polytechnic Institute.

The main theme of this paper was that the effective use of language is essential to good engineering. The subject of semantics in writing was discussed. In other words, use the precise word for the idea that you wish to convey. In the English language there are many words which mean the same thing, and conversely, one word may have several different meanings. To write clearly, the writing must have emphasis. If you wish to state an important point at the end of a report, it must have dramatic emphasis to get the point across. For effective writing Mr. Gould suggested various ideas. If necessary, modify the handbook rules. If writing for an audience who may understand jargon, use it, but only if your reader is able to comprehend it. The mechanics of writing, of course, are quite important. Things such as sentence structure, topic and periodic sentences, paragraphing, headings for technical material, all must be kept in mind to write effectively. Finally, technical writing should contain less interpretation and more illustration.

I. Effective Visual Communications by L. K. Hamilton of the Technifax Corporation.

Mr. Hamilton presented a general discussion on the use of visual aids when presenting technical material. Visual aid and the human voice provide the most effective means of communication. A demonstration of some of today's techniques on visual communications, including do's and don'ts of effective speaking with visual aids, were the main ideas which were discussed.

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